

## REMARKS

Review and reconsideration of the application in view of Applicants' amendments and remarks are respectfully requested. Claims 16-25, 27-39, 54-62 and 64-86 remain in the present application. Applicants have cancelled Claims 14 and 52. Applicants have withdrawn Claims 1-13, 15, 26, 40-51, 53 and 63. Applicants have amended Claims 3, 16, 19, 21, 22, 32, 37, 38, 45, 54, 58, 59, 69, 70, 74, 77 and 78.

The Examiner has determined that Claims 26 and 63 do not read on Applicants' elected species. Applicants agree with the Examiner's analysis and have withdrawn Claims 26 and 63. Applicants apologize for any confusion this caused.

Applicants have provided a legible copy of the reference "SANCHEZ et al. J Mater. Chem. 1999, Vol. 9, page 35-44.

The disclosure has been objected to for certain informalities. Applicants have amended the specification to provide the proper patent number for application 09/818,956 on page 4. Applicants have amended page 24 to capitalize the trademark LUDOX.

The specification has been objected to for failing to provide the proper antecedent basis for claimed subject matter. Applicants have amended the specification on page 23, line 20 to insert "R<sup>1</sup> is preferably aliphatic, cycloaliphatic, or aromatic group containing 1 to about 12 carbon atoms" and on page 23 line 23 that "R<sup>1</sup> is preferably and alkyl or fluoroalkyl of 1 to about 12 carbon atoms". Support for these amendments is found in Claims 31, 32, 69 and 70 as originally filed.

In paragraphs 3, 4, 5 and 6 on page 5 of the Office Action the Examiner has said the specification lacks antecedent basis for the recitations in Claims 36-39. Applicants have amended the specification at page 10 to correct this deficiency.

In paragraphs 7 and 8 of the Office Action the Examiner has stated that Claims 80-83 lack antecedent basis. Applicants have amended the specification at page 28 to correct this error.

In paragraph 9 of the Office Action, the Examiner states Claims 83-86 lack antecedent basis. Applicants have amended the specification at page 11 to provide antecedent basis in the specification for Claims 83-86.

Claims 14, 19, 21, 22, 52, 58, 59 and 74 have been rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14 and 52 are considered indefinite. Applicants have cancelled these claims.

Claims 3, 19, 45 and 74 have been amended to provide proper Markush language.

Claims 21, 22, 58 and 59 have been amended to provide proper Markush language.

Claims 37-39, 52 and 77-79 have been objected to due to formalities.

Claims 37, 38, 77 and 78 have been amended to recite the use of a polar solvent medium. Claim 40 has been withdrawn and Claim 52 has been cancelled so the objection to Claim 52 is rendered moot.

Claims 54, 55, 59-62, 64-73, 75-80 and 83-86 have been rejected under 35 USC § 102(e) as anticipated by or, in the alternative 35 USC § 103(a) as being obvious over US 6,495,300 B1 (Qi). Applicants have amended Claims 16 and 54 to include the following limitation “from about 5 to 30 weight percent of colloidal silica based on the weight of the charge transport polymer”. Support for this amendment is found on the specification at page 24, line 17-23 and in the Examples. With this amendment Qi no longer anticipates every element of the claims.

The Examiner points to Example 1 of Qi and asserts that formula IV-a meets the structural limitations of the instant Claims 54, 75, 80, 83, 84 and 86. However, this polymer is formed into a layer through reaction with an organo silane compound in a mixture of ethanol/water and silica particles. Amended Claim 54 requires that the polymer be reacted with 5 to 30 weight percent of colloidal silica based on the weight of the polymer. Colloidal silica is distinguishable from the silica particles of Qi in that colloidal silica is a dispersion. The dispersion is typically basic. The surface of the silica particles in colloidal silica are negative so that they repel each other to form a stable sol. The AEROSIL™ 200 silica used by Qi is a fumed silica made by pyrolysis. The pH of the AEROSIL™ 200 particles are all about 4. A pH of 4 will not catalyze the sol-gel condensation reaction (curing). Thus, Applicants contend that Qi no longer teaches every element of Applicants' claims and a rejection under 35 USC

102 (e) is not supported. Likewise a rejection under 35 USC 103 (a) is not supported as Qi teaches that silica particles be used to form the layer. Silica particles do not include colloidal silica, as colloidal silica is in the form of a sol-gel, and therefore Qi teaches away from the instant invention as defined in the amended claims.

Moreover, fumed silica would not function to cure the sol-gel as it does not carry with it the basic charge carriers ( $\text{Na}_2\text{O}$ ) that colloidal silica has associated with it. Thus, fumed silica is not a catalyst for the sol-gel condensation reaction. In Applicants' invention, the combination of acetic acid and sodium oxide on the colloidal silica is the real catalyst. Acetic acid reacts with the sodium oxide (or sodium hydroxide) to form sodium acetate. This is detailed in US Patent 3,986,997 to Clark, column 6 lines 50-55: "*this increase in hardness...is attributed to the catalytic action of sodium acetate which was formed upon addition of colloidal silica to the acidified silane.*" As stated above,  $\text{Na}_2\text{O}$  reacts with the acetic acid to form sodium acetate, which is a catalyst for the condensation. As taught by Clark in US Patent 3,986,997 in column 2, lines 40-51: "*It is preferred to use colloidal silica of 10-30 millimicron particle size in order to obtain dispersions having a greater stability and to provide coatings having superior optical properties. Colloidal silicas of this type are relatively free of  $\text{Na}_2\text{O}$  and other alkali metal oxides, generally containing less than 2 weight percent, preferably less than 1 weight percent  $\text{Na}_2\text{O}$ . They are available as both acidic and basic hydrosols. Colloidal silica is distinguished from other water dispersible forms of  $\text{SiO}_2$ , such as nonparticulate polysilicic acid and alkali metal silicate solutions, which are not operative in the practice of the present invention.*" Thus only a small amount of  $\text{Na}_2\text{O}$  is desirable. Ludox LS (low sodium) which contains 0.10 wt %  $\text{Na}_2\text{O}$  is used in the Examples of the instant as it has less free alkali and may be used to give greater compatibility with water miscible solvents or polymer emulsions.

Claims 14, 16, 17, 22-25 and 27-39 have been rejected under 35 USC § 102(e) as anticipated by or, in the alternative 35 USC § 103(a) as being obvious over Qi, as evidenced by applicants' admissions at page 40, lines 8-14 of the specification. Claim 16 has been amended to require the polymer be reacted with 5 to 30 weight percent of colloidal silica based on the weight of the polymer. Qi teaches away from using colloidal silica and this rejection is not supported.

Claims 54-62, 64-80 and 83-86 have been rejected under 35 USC § 103(a) as being unpatentable over Qi combined with Tamura, as evidenced by Diamond, Handbook of Imaging Materials, p. 426 and Fig. 9.22 at page 430 (Diamond) and US 6,376,695 B1 (Kushibiki). As mentioned above Qi does not teach the polymer being reacted with 5 to 30 weight percent of colloidal silica based on the weight of the polymer. Since the amended claims are distinguishable over Qi and the combination cited by the Examiner does not make out a *prima facia* case of obviousness, the rejection should be removed.

Claims 56-62, 64-80, and 83-86 have been rejected under 35 USC § 103(a) as being unpatentable over Qi combined with Tamura, as evidenced by Diamond and Kushibiki. The remarks in the previous rejection are applicable here and this rejection should be removed.

Claims 14, 16-25, 27-39, and 52 have been rejected under 135 USC § 103 as being unpatentable over Qi, as evidenced by Applicants' admissions I, combined with Tamura, as evidenced by Diamond and Kushibiki. The remarks in the previous rejection are applicable here and this rejection should be removed.

Claims 14, 16-21, 23-25, 27-29, 36-39 and 52 have been rejected under 35 USC § 102(b) as anticipated by or, in the alternative, under 35 USC § 103(a) as obvious over US 2001/0017155 A1 (Bellmann), as evidenced by Kushibiki and as evidenced by Applicants' admissions II at page 22, lines 12-14 and 25-26 of the instant specification. Applicants' respectfully traverse this rejection. Bellmann does not teach every element in Applicants' invention and the rejection under 35 USC § 102(b) is deficient. Bellmann discloses a polymer containing 1 to 15 percent of a trimethoxylvinylsilane; however, Bellmann does not teach the divalent bridging moiety Y in Claim 16.

It was known and reported vinylsilanes react only sluggishly under typical radical polymerization condition. If the Si atom is adjacent to the vinyl group, as the structure in trimethoxylvinylsilane, the reactivity ratio in copolymerization is close to zero due to the interactions between the Si atom and vinyl group. Several reference examples are: Rao et al. Eur. Polym. J. 1989, Vol. 25, page 605; Gaitca et al. Polymer Bulletin, 1999, Vol 43, page 171-172; and Bellmann et al. Chem. Mater. 2000, Vol. 12, page 1350 and 1351. Applicants have provided copies of these references. In Bellmann's publication, the radical copolymerization with trimethoxylvinylsilane disclosed in US 2001/0017155 A1 (Bellmann) was fed

with extreme excess amount of trimethoxylvinylsilane, but still yielded very low content of trimethoxysilane in copolymer. The polymerization results in Table 1, page 1351 of the publication, indicated more than 90% of trimethoxysilane remaining unreacted in all of their polymerization experiments. With the divalent bridging moiety Y in Claim 16 of this Applicant's invention, the reactivity ratio of vinylsilane, e.g. methacryloxypropyl trimethoxysilane in Examples of this invention, is efficient and yielded copolymer with content of trimethoxysilane close to the feed ratio of trimethoxysilane monomers. Thus, the rejection under 102 (b) must be removed.

Moreover, with the amendment to Claim 16, there is no mention of a polymer being reacted with 5 to 30 weight percent of colloidal silica based on the weight of the polymer. Thus, Bellman fails to show every element of Applicants' invention. Further the secondary reference does not correct the deficiencies in this rejection.

For at least the reasons set forth above, Applicants submit all of Claims 16-25, 27-39, 54-62 and 64-86 remain in the present application are in condition for allowance. Prompt and favorable action is respectfully requested.

Should the Examiner require anything further, or have any questions, the Examiner is asked to contact Applicants' undersigned representative.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.